STAR DANCER

490 MERIDIAN

SECOND EDITION
MAY 20, 2010

A Note from the Owners of Star Dancer

Welcome aboard and thank you for choosing Star Dancer for your cruising vacation. Star Dancer is a 2003 Meridian 490 Pilothouse.

When you and your guests come aboard, a representative of Anacortes Yacht Charters will conduct a checkout and systems review, including a briefing on safety and operating considerations. Please ask any questions, you wish, to clarify your understanding. Reviewing this manual prior to your departure will be helpful and will help to make your cruise more enjoyable.

We strive to keep Star Dancer in top condition and well equipped, but there is always room for improvement. While on your cruise please write down anything you notice that we could improve or change to make your next cruise more enjoyable. Pass these suggestions and recommendations on to the AYC staff. We thank you in advance for your assistance.

We invite you to treat Star Dancer as your own while you are on your cruise. She is a Star and you are an experienced skipper. This combination should make for a very enjoyable cruise. Enjoy and we hope to see you back next year.

BOAT OPERATION

ENGINES

The main engines on Star Dancer are very reliable Cummins diesels. If treated correctly, they can be expected to give trouble-free economical cruising. The engine room is accessed through panels in the floor of the salon or through a hatch at the top of the companionway stairs next to the refrigerator.

Twin Cummins Diesels – Model 6BTA 5.9M3 – 330 HP each
Freshwater cooled

The hour meters are at the aft edge of the DC panel in the pilothouse. Record these readings in your log entry and check the log to see what they read at the last refuel (Experience has shown that fuel gauges are often not accurate. We suggest that you track your fuel consumption rate as a double check on the fuel gauges)

Pre-start

Remember "WOBBS" prior to each cruising day: **W**ater (Coolant), **O**il, **B**ilge, **B**elts and **S**ea Strainer. The inspection is best done in the morning while engines and engine room is cool.

Check coolant level. Forward of each engine is an expansion tank. Fluid in the expansion tanks will indicate a proper coolant level. If you lift the salon floors and the engines are cool, you can reach your finger in at the caps on the top of the engines. If you can reach coolant with your finger, it is fine. Coolant is a 50/50 mixture of antifreeze and water. If coolant level is down look for a sign of a coolant leak under the engine. If the are signs do not run the engine. If no leak add water.

Turn engine room lights on at DC panel in pilothouse. Lift the top step, next to the galley. Climb in and open the hatch into the engine space.

Check Oil levels. Check the level of each engine's oil with the dipsticks located on the inboard side of each engine. The dipstick handles are yellow and lock/unlock with a slight turn (lock caps after checking so they don't inadvertently come loose). The oil level should be between the two marks on the dipstick. Use a paper towel to wipe the stick, reinsert, and check the level. The distance between the two marks is about 1.5 quarts. Only fill if oil levels are below the add mark. Do not overfill!!! The oil fill on each engine is atop its valve cover. After refilling, be sure to retighten the cap. Do not over tighten.

Visually inspect V-belts, hoses, engine mounts, coupling bolts, sea strainers (located aft of each engine) and fuel filters. Look for leaks, wear, or looseness. To inspect sea strainers hold a flashlight behind the filter and look through it for anything that could clog the filter.

Visually inspect the bilge. Check under and around the engines. During your inspection, ask yourself if everything looks (and smells) right.

Check the general condition of the belts and hoses.

Sea Strainers: Ensure the valves on each RAW WATER THRU-HULL are open. (The lever is in-line with the hose or valve). The Raw Water Thru-hulls are normally left in the open position. However, if they are closed, there will not be any water flow from the stern exhausts when the engines are running. This will lead to a serious overheat condition and engine damage. Look through the glass of each RAW WATER SEA STRAINER for debris. A flashlight held behind the glass strainer makes it easier to see debris. A clogged strainer will cause the engine to run hot or overheat. If necessary, close the thru-hull valve, open the strainer cover, clean out debris and reassemble. Remember to REOPEN the thru-hull valve.

START ENGINES

Ignition keys are in the pilothouse starboard drawer. Make sure the "Engine" and "Accessory" battery switches are on (they should have been left on). These are in the battery management panel on the port side of the salon.

At the top of the DC switch panel (the aft panel in the cabinet on the starboard side of the pilothouse) turn on the DC Master and the Ignition Power switches for the port and starboard engines.

Place the transmission selector levers (levers with the black knobs) in the Neutral (N) position and the throttle controls (levers with the red knobs) in idle position (pulled fully to the aft). Engines have a Neutral lockout so small adjustments of the transmission selector levers may be necessary if the engines don't start.

If starting the engines for the first time of the day, make sure to preheat the engines. Turn the port engine ignition key clockwise; a buzzer will come on. When the green light comes on turn the key further to the right to start the engine. Follow the same process with the starboard engine. Wait for the buzzer to stop after starting the port engine before starting the starboard engine. Engines usually start very quickly. DO NOT continuously operate the starter for more than 15 seconds at a time.

If the battery is low, engage the Battery Parallel Switch located at either the pilothouse or bridge helm to connect other batteries. The Parallel Switch must be held in position while starting. Releasing the switch will return the electrical system to the normal mode. It is not normally necessary to have to use the Parallel Switch so be sure to inform AYC upon your return.

If engine doesn't start, wait for at least 30 seconds before making another attempt. If after two attempts the engine does not start, try to determine the cause before proceeding.

After engines start, walk out to the swim step and check the exhausts for water flow. If there is none shut the engines off immediately and troubleshoot, starting by checking the sea strainers. Sea strainers are the large bronze and glass cylinders, located aft in the engine room, that filter debris out of the raw waterside of the cooling systems. Remember to close the seacocks before opening the strainers and to REOPEN when done.

Warm engines at idle a minimum of 5 minutes before maneuvering and span your initial acceleration over a 5- minute period.

If engine alarms sound (due to low oil pressure or high water temperature), shut down engine IMMEDIATELY and troubleshoot. Was there a lack of water exiting with the exhaust? Are thru-hulls open and debris cleared from sea-strainer? If problem keeps occurring, call AYC Service.

Caution: Continuous operation with low coolant temperature (below 140 degrees) or high coolant temperature (above 205 degrees) can damage engine.

GETTING UNDERWAY

Disconnect the shore power cord. Remove spring lines leaving only bow and stern lines. Close portholes and hatches. Check for items that may fall in rough water and put them in a safe place. Turn on electronics-VHF radio, Depth Sounder (switch is on bridge helm), Navigation systems and radar screen. Prior to leaving, ensure the Bow Thruster is turned on by simultaneously pushing both on switches from the helm position you will be driving from. The Bow Thruster should only be used in 3-5 second bursts. It will overheat and/or drain its battery quickly if used continuously and then not be available when you need it. You might want to give the Thruster a quick tap toward the dock to make sure it is functioning. Turn the Thruster off when it is no longer needed.

Have a plan on how you want to leave the dock prior to untying the lines. Make sure everyone knows the plan and don't be shy about asking for, or accepting help from fellow boaters. Don't ever assume others will do what you expect. Tell them what you want them to do. Communicate with your crew.

All close quarter maneuvering should take place from the bridge helm. This will afford maximum visibility. If operating from the pilothouse, ensure both doors are open to allow quick access to both sides. Make certain the throttles are in idle and engage the gearshifts. Once outside marina, have crewmembers bring in fenders and put lines away. Remember to turn the Bow Thruster off once it is no longer needed.

CRUISING

Slowly come up to your desired cruising rpm. (Do not exceed 1400 RPM until the engine temperature gauge reads at least 140 degrees). Star Dancer can cruise nicely at approximately 16-17 knots. However, the realities of vessel hull design and power plant engineering dictate that higher RPM operation will be less efficient on semi-displacement hulls. Thus, you will notice from the following table that every knot above "displacement speed" (about 7 knots) can get expensive.

RPM	Gallons/Hour*	Speed (Knots)*	Nautical Miles/Gallon*
1000	2.6	7.0	2.7
1500	6.0	9.0	
2000	15.0		
2400	22.0	17.0	0.77

- Gal/Hour, Speed and NM/Gal are extracted from Nor'Westing magazine, but will obviously vary with vessel load as well as weather and sea conditions.

The Trim Tabs can be effective at bringing the bow to the ideal cruising attitude. Once established at cruise, make minor adjustments and watch your speed on the GPS to see if it improves.

Do not exceed 2400 rpm except for very brief intervals. (High engine speeds causes the engine to overheat (over 205 degrees) causing damage as well as high fuel consumption). Cruising at rpms of 1200-1400 provides the most economical cruising as well as the most quiet and softest ride.

DOCKING

Just as with leaving the dock, **have a plan**, to bring Star Dancer into a dock. Before entering the marina or nearing the dock decide which side of the boat will go against the dock and set your fenders. Also attach a stern line, amidships line and a bow line so they are ready to use for docking. During docking, as with any close quarters maneuvering, it is best to use the bridge helm for the maximum visibility. If using the pilothouse, make sure you open both doors so that you can quickly assess your clearance. Since it is difficult to see the stern from either driving position, it is wise to have an experienced person handling the stern line so that they can also advise you of your position. Give clear instruction to the crew on what you will expect of them (i.e. lines and fenders). Communicate with your crew.

Ensure trim tabs are all the way up (bow up position) before backing. While moving slowly towards the dock, center the wheel and use the gears to maneuver the vessel. Throttles should be in idle position. The one exception is in windy conditions when it may be necessary to increase the rpms to maneuver the boat against the wind. It is not likely to need more that 800-900 rpms to deal with the wind conditions. Prior to docking,

ensure the Bow Thruster is turned on by simultaneously pushing both "on" switches from the helm position. The Bow Thruster should only be used in 3-5 second bursts. It will overheat and/or drain its battery quickly if used continuously and then will not be available when you need it. Turn the Thruster OFF after you've docked.

SHUT DOWN

Before shutting down, the engines should idle for about 5 minutes to let them cool. This is usually not an issue as engines will be at idle for a sufficient period of time during docking maneuvers. Ensure that each gearshift is in the neutral position and each throttle is in idle. Turn off the engines using the ignition keys.

FUELING

Star Dancer uses Diesel # 2 fuel. ONLY the skipper should fill fuel tanks being sure it is filled at the deck plates labeled "Fuel" and NOT "Water" or "Waste". Also make sure the fuel is indeed diesel and not gas (trace back to the pump). Be careful not to spill fuel (it pours like beer and foams like beer). Each fuel tank must be fueled separately as they do not cross fill to the other side. One way to get to both fuel tanks, without moving the boat is to open the salon windows and pass the fuel hose through the salon. Before pumping, have your oil/fuel sorb ready to soak up any spilled fuel. You should have a rough idea of how many gallons you will need to keep from filling too fast and spilling. As the tank fills, the sound will rise in pitch or gurgle. With a little practice you can tell by the sound when the tank is nearly full.

Check your fuel gauges. Replace the deck fill caps and turn on the engine room blower for a few minutes while you pay. Clean up any spatter and wash hands thoroughly.

DO NOT TRUST FUEL GAUGES. As a policy, top off the tanks approximately every 15 engine hours. This leaves a margin to guarantee you will not run out of fuel. The port tank feeds the port engine and the starboard tank feeds the starboard engine and the generator

Three RACOR fuel filters are mounted in the engine access under the top step next to the galley. Inspect them whenever you are in the engine room. Water will appear separate from the fuel and can be drained out the petcock at their bottoms. A little dirt is okay but if they look dirty call AYC to change the filters.

The fuel valves/manifold are also located on the forward wall in the same area. Call AYC before messing with these. The proper position for these valves is that all are in the straight up and down position. It is easy to bump these when going below to check engine oil. Always check them when going out of the engine room hatch.

SAFETY EQUIPMENT

Life jackets are located below the cushion, under the window, on the port side of the pilothouse.

There are 3 fire extinguishers. One in front of the pilothouse exit door on the port side. One in the cockpit next to the fresh water washdown on the stern and one on the flybridge on the port side fore of the davit.

There is a “throw ring” for a “man overboard” on the starboard side of the stern cockpit. It is intended to keep a “person overboard” afloat.

There is a “life ring retrieval system” with a 50’ line attached to the boat at the top of the ladder to the flybridge.

There is a flare kit with other signal devices in the cabinet under the electrical panel in the pilothouse.

There is a first aid kit in the cabinet under the electrical panel in the pilothouse

ELECTRICAL

GENERAL:

A 490 Meridian has an electrical system that requires special understanding. Before reporting any system failure search for that system’s second or even third switch. There are many redundancies. For example: the depth sounder circuit on the DC main circuit board must be on. Also the depth sounder switch on the flybridge to the left of the wheel must be on.

The electrical needs of a 490 Meridian can potentially high. Therefore you may need to prioritize at times and use some appliances only when others are turned off. Pay attention to the amperage meter on the main circuit board to keep tabs on the amperage draw. When plugged into 30-amp shore power do not exceed 30 amps draw. The biggest amperage pigs are the water heater and the electric stove.

AC POWER

The AC panel is in the forward half of the starboard side cabinet in the pilothouse. Either plugging into shore power or turning on the generator energizes the panel. For very limited needs the inverter will also energize the panel. There are two knobs for selecting your AC circuits. Both are located at the top of the AC panel.

There are 3 “lines” of switches. Each “line” has a master pair that must be on for that line to work

WHEN YOU PLUG INTO SHORE POWER…

Turn off the dock socket before plugging or unplugging either end of the cords. This prevents arcs, sparks, and shocks: and the cords, sockets and plugs will last longer. It is good practice to plug in the boat end of the cord before plugging into the shore outlet. Turn the dock socket on when both ends of the electrical cords are securely connected. It is important to take a loop around the dock receptacle and another around a boat cleat to keep the cord out of the water and to provide some slack to keep the plugs from detaching.

There are three SEPARATE circuits on the AC panel and four separate receptacles on the starboard outside deck aft of the pilothouse door. The two forwardmost receptacles are the main ones (lines 1 and 2). Use line 1 (receptacle towards the bow when connecting with one powercord) The third receptacle is not used. The fourth one is for a phone and cable TV connection.

There are three 30 amp cords with sockets on board. They are located under the forward seat cushion on the port side of the pilothouse. There is one Y-adapter for a 50amp/250volt shore connection. It is possible to connect one or two 30 amp cords simultaneously. There is also an adapter for a 15-amp system.

Have your source selector switched to Off to confirm available voltage, switch on the meter at the top of each "line". The voltmeter at the top of this panel will then confirm that you have 110 to 120 volts available. The red "polarity hazard" lights for each line should NOT be on. If either light is on do not use shore power unless you can solve the problem.

There is an ammeter at the top of each "line" of switches telling you how much power you are using. If you turn on a lot of AC items, this meter will tell you when you are reaching the capacity of the socket you are plugged into and when to prioritize your AC uses.

Turn the master circuit breaker on at the electrical panel. Turn on appropriate switches for battery charger, refrigerator, etc. Watch your amp meter for load. If the load exceeds the supplied amps, it will pop the breaker. If this occurs, wait to turn on one of your high draw systems (i.e. water heater until the use of power decreases (the battery charger/inverter charger may initially pull a heavy load depending on the battery state).

If your outlets fail to work, check your GFIs to make sure that they have not been tripped. One GFI (like the one behind the coffee pot or in the pilot house) often control of more than one outlet (e.g. kitchen GFI controls the salon TV outlets).

Before disconnecting from AC power start up the Nobeltec Navigation System. It requires AC power to activate. It will switch to DC power if the DC computer switch is on when AC is disconnected. Nobeltec will also start with generator power.

DC POWER

There are four battery banks in your 12-volt system: Port Engine/Generator Start Batteries, Starboard Engine Start Batteries, House/Inverter Batteries and the Bow Thruster Battery.

The battery master switches are located aft, next to the salon sliding door on the port side. Normally you will leave the switches in the on position except for the anchor winch and the davit battery switch. There is a DC MASTER SWITCH (it is black) on the left of the panel. It must be switched to the right for the DC system to work. Note that it will trip if it detects a problem with the DC circuitry. Note: Changing the position of the battery switches with the engines running will cause damage! Only change positions with the engines off and only if necessary!

The DC panel is in the starboard cabinet in the pilothouse. The DC MASTER switch has to be on before any of these switches will work. Remember that there may be helm switches such as Navigation Lights or Depth Sounder that also have to be switched on or off at the upper helm.

With the DC MASTER on and the ENGINE START switches on check the level of charge in the batteries by rotating the switch on the upper right and watching the meter to the left of the switch. This does not show the level of charge of the bow thruster battery or the inverter batteries. The inverter will show the charge level of its own batteries.

The DC electrical panel (right side of the electrical panel in Pilothouse) shows all the systems supported by your batteries. You will be turning on these breakers for lights, water pressure, electronic, etc. This will allow you to manage your power usage. Certain breakers should be turned off after each use (engine room light, washdown pump, etc). Bilge pumps should always be left on.

When disconnected from shore power (and without the generator running), the 12-volt systems will drain the house batteries, especially when at anchor. Monitor your batteries very carefully. When anchored, turning off high draw items (icemaker, bridge lights, refrigerator, water heater) will extend battery time between charges. The DC voltmeter on the DC panel can be switched between the battery banks to measure battery voltage. Typically the bank should read from about 13.0 to 14.5 volts when being charged. While at rest, the voltage will drop as indicated in the figures below.

Voltage	Battery State of Charge
12.65 volts	100%
12.47 volts	75%
12.25 volts	50%
11.95 volts	25%
11.70 volts	0%

Note: Voltage will tend to read less than actual if the batteries are under load (being used). The only true voltage measurement comes from a battery that is not under load nor has been for a brief period of time. Therefore, you will probably have a little more battery power remaining than indicated.

All the batteries are charged while underway (above 1000 RPM) by the alternators. Caution: Alternators may not be able to keep up during times of heavy draw on house bank. The engine and house batteries are charged by the battery charger and inverter charger while connected to shore power or on generator power. Ensure that the battery charger (Start Banks) is on as well as the inverter charger (House Bank)

Battery Locations:

Port Engine Start Battery: Port Engine chargs it own battery. In Starboard Lazarett
Starboard Engine Start Battery: Starboard Engine charges it's own battery, the house batteries and the bow thruster battery. In Starboard Lazarett
House Batteries: Charged by Starboard Engine
Bow Thruster Battery: Charged by Starboard engine. Under master suite bed
Generator Battery: Charges its own battery. In Port Lazarett
Inverter Batteries: In Port Lazarett
Note: All batteries are charged by the generator or with shore power with "charger switches on" except bow thruster battery.

INVERTER POWER

The Inverter provides AC power to the 110-volt receptacle plugs and the microwave oven when the boat is disconnected from shore power. The inverter does not provide power to the water heater or the battery charger. The inverter panel is located on the starboard side next to the stairs from the salon to the pilothouse. The inverter itself is located in the Port Lazarett.

The inverter's power source is the DC house and inverter batteries. The quantity of DC power is limited to the capacity of these batteries. Running hair dryers, toaster, coffeepots, space heaters, etc will quickly discharge the house/inverter batteries. Use these items very sparingly and monitor your battery usage carefully.

When connected to shore power, the inverter automatically becomes a battery charger for the 12-volt house/inverter batteries. Should you detect the inverter failing to charge the house/inverter batteries, check the circuit breaker in the AC panel and the inverter control panel.

GENERATOR

The Generator can supply all the AC power that you can get from shore power. It can be run while under way or stopped. This gives tremendous flexibility, especially when at anchor.

To start the generator, ensure that the fluids have been checked and the raw water thru-hull is open. (Note: The generator dipstick is on the port side near the bottom of the generator. You must remove the access panel first.) The generator controls are located on the bottom of the AC electrical panel in the pilothouse. TO START: Check to confirm that the generator's battery switch is on. It is located in the battery management panel in the port, after corner of the salon.

The generator controls are located on the bottom of the AC electrical panel in the pilothouse. To start, hold the switch in the Start/Preheat position until the engine catches (10-20 seconds). You should hear the generator engine start as well as see the generator instruments light up on the electrical panel next to the switch. Go to the swim step and make sure the cooling water and exhaust is exiting at the stern. After the generator is running, turn on the Generator Main Breaker and check for good voltage. Then turn on the Generator Master Breaker (Dockside Master must be off and slide guard down. Turn on the AC systems as you would if hooking up to shore power. If you have been anchored for some time, the battery charger/inverter charger may take up a large load so you may want to keep other high draw items off initially. The generator can carry a large load, but too much load such a water heater, stovetop, etc may overload the system.

To turn the generator off, **first take off the load** by turning the AC breakers off. Turn off the main AC distribution switch. Turn off the Generator Main Breaker. Kill the generator by hold the switch in the stop position until it stops.

Note: It is fine to run the generator as much as you see fit. However, it is not good for the generator to run without a load on it. That means you should have a reason for it to be running (water heater, oven/stove, recharge the batteries, etc.) It is usually not necessary underway, as you have the inverter (unless the starboard alternator is not keeping up with high electrical usage)

SANITATION SYSTEM

VACUFLUSH TOILETS

Star Dancer is equipped with Vacuflush heads. They are easy to use, odor free and are temperamental but reliable. They use fresh water for flushing. To keep them operating properly, use a minimum of toilet paper. Flush the heads by depressing the foot pedal and holding it down for a full 3 seconds. If you wish to add more water to the bowl, pull up on the foot pedal.

The system can make or break your vacation. Therefore, it is imperative that every person on board be informed on the proper use of the toilet. If you don't tell them how to use the heads they will not know how to avoid clogs. The valves, openings, and pumps are small (about the size of a quarter) and can clog easily. If the head gets clogged, it is your responsibility. Always flush the head for small children so you can be certain of what is being flushed. If you have a large amount to waste it may be wise to flush the waste first, then flush the toilet paper.

NEVER PUT IN PAPER TOWELS, NAPKINS, SANITARY PRODUCTS, and HOUSEHOLD T.P. OR FOOD INTO MARINE HEADS. USE ONLY MARINE TP (PROVIDED BY AYC).

Note: If the bowl doesn't seal completely after use, try flushing again and making sure nothing is stuck in the seal. Hint: release pedal quickly.

HOLDING TANK

The sanitation holding tank holds approximately 40 gallons. Be aware of the rate of waste production. If the tank becomes overfilled it will break a hose, clog a vent or burst the tank. The result will be an indescribable catastrophe and an expensive fix to you. Empty the tank at least every other day to avoid any problems.

The holding tank is located in the engine room, on the starboard side under the salon sofa. Its necessary to check the holding tank level each day by looking at the level of water in the tank with a flashlight. There is no tank monitor.

The holding tank can be emptied in one of two ways:

#1 At a pump-out station, remove the deck waste cap located starboard near the fuel fill. Be careful removing the waste cap. It is not connected to the boat. Insert the pump-out nozzle into the waste opening (double-check that you have the right deck opening). Turn on the pump on the dock and open the valve on the handle of the hose. When pumping is finished, close lever on handle and turn off pump. If there is a fresh water hose on the dock, rinse the tank by adding water for 1-2 minutes. Then pump again to leave the tank rinsed and clean. This also helps to eliminate any head odors.

#2 The tank's contents can also be discharged at sea by using the macerator pump. This is absolutely not permitted in US Waters and is subject to very severe fines. To operate the macerator, after making sure the macerator seacock is open, depress both of the Macerator Rocker Switches (located on the DC electrical panel). Listen to the macerator's sound. When the pitch becomes higher, the tank is empty. The only way to hear the pitch is to bring the boat to idle and lift up the companionway stairs. It should only take a few minutes to empty the tank.

WATER SYSTEM

FRESH WATER TANKS AND PUMP

Star Dancer holds 200 gallons of fresh water located in two separate tanks. To fill the tanks, remove the deck water fill caps located on the port side of the bow. Use the food grade white-blue stripe hoses (stored in the starboard compartment in the cockpit). Fill only with potable drinking water. A manifold to switch tanks is located under the companionway stairs on the port side of the compartment. There are two hoses feeding into the water pump. Each line has a shut off valve. Turn clockwise to close and counterclockwise to open. Only open one tank at a time since the upper/forward tank (130 gallons) will empty first and then allow air to flow along with the lower/midship tank's water (70 gallons) to the pump.

The water pressure pump is located under the companionway stairs on the port side. Activate the pump by turning on the "water pressure
breaker at the DC panel. The pump is a demand pump and will only come on when pressure is needed. **If the pump continues to run, it is either out of water or has an air lock (which can be corrected by opening a faucet). If you run out of water immediately shut off the pump and turn off the water heater by turning off their respective breakers on the AC panel**. Switch to the full tank as directed in the preceding paragraph. Serious damage to the heating element can occur if the water heater is on without water.

Ensure the Water Pressure breaker is off if you are leaving the boat for an extended time to prevent loss of water (and running of the pump) through a faucet being accidentally left on.

Note: "Grey water" from the sinks and showers drains overboard through various above water thru-hulls.

WATER HEATER

The water heater has a 18-gallon capacity. It is located under the companionway stairs on the forward wall. It is heated when the AC breaker is on while connected to shore power or running the generator (will not run off the inverter). The hot water tank does not heat with just the main engines running.

SHOWER

Before taking a shower, make sure the water pressure and shower sump pump breakers are on. The Master Stateroom shower drains automatically by a float switch in the sump pump. If it is not operating properly, it may be clogged and need to be cleaned by carefully removing the lid (It is located behind the glass doors in the hallway). The Guest shower drains via activation of the RED switch near the toilet. You will know the guest sump pump is operating because it is quite loud. Please wipe down the shower stall when

finished to keep the shower presentable. Pick up any accumulation of hair in the drains as it clogs the hoses. Ensure that the faucets are tight turned off after each shower.

FRESH WATER WASHDOWNS

There are fresh water washdowns located on the bow (in the locker near the anchor) and aft (in the port compartment in the cockpit). Be sure they are completely turned off after use to prevent loss of water (especially the aft washdown which can end up in the bilge). The system uses it own pump (breaker on DC Panel) located under the center lazarette. The Breaker should be turned off if not needed. There is an extra washdown for swimmers next to the door to the transom step.

GALLEY

The galley is equipped with a number of appliances for your convenience. Most of these are easy to operate. Nevertheless, there are some features that are different than a home model.

STOVE/OVEN

The stove and oven are electric. You must be hooked up to shore power or have the generator running to operate them because of the high electrical draw. Turn the "Electric Range" breaker on (AC Electrical Panel) and operate as a standard kitchen electric stove/oven. Use care when raising/lowering stove cover.

It you are using the oven, you are limited to only two of the three top burners. The upper control on the far left of the stove/oven has two positions "Stove Burners" and "Oven". When switched to the oven position the front left burner on the stovetop will not function.

If the AC Master Breaker trips while operating the stove/oven, turn off another high draw item (like the water heater or icemaker) until finished cooking.

When done using the stove and/or oven, let the burners cool before lifting and lowering the lid. Without lifting the lid first you will damage the lid.

MICROWAVE

This microwave is operated just like a home model. Do not leave the oven rack or any metal object in it while operating as a microwave!

REFRIGERATOR

The refrigerator is dual voltage (110 volt AC and 12 volt DC). Its capacity is approximately 16 cubic feet. Normally leave both refrigerator breakers in the ON position. It will automatically use the 110-volt power when shore power/generator is on and DC power when AC is not available. Carefully monitor the use of the refrigerator

when on 12-volt power such as when you are at anchor. Use a cooler when available to keep the refrigerator door closed as much as possible.

The power switch is located on the front door of the refrigerator. Be careful not to turn too high as items will freeze and possibly rupture. A setting of 2.5 or 3 should be good.

ICE-MAKER

The icemaker uses lots of energy. It operates just like most home icemakers and must have an AC source of power. It is important to make sure that the door is closed all the way and latched except when you are getting ice.

Check to be certain the water pressure is on (DC panel) to supple water to make ice. Look inside to be sure the wand is flipped down. This wand flips up automatically to stop production when the icemaker is full of ice, or you can flip it up manually to stop production is ice and keep the icemaker cold.

At the end of your trip turn the icemaker OFF and PROP IT OPEN to prevent mold.

WASHER/DRYER

The washer/dryer is located in the hallway between the staterooms. It is powered by 110 volt making it less powerful than a home dryer operating at 220 volts. Please use smaller loads for the machine to operate properly. IMPORTANT: The washer uses much less soap than a home machine, approximately 1/3 the amount. A teaspoon is a good amount to use. Use liquid soap only! There should be some liquid soap located in the guest head, lower cabinet. Pour the soap, and softener if desired, and set the timer. The dryer operates slowly so please be patient or finish drying outside

TRASH COMPACTOR

The compactor is an AC-only appliance so it needs shore power or the generator on-line to operate. Please do NOT run it with little or nothing in it. The arm that presses down can over extend its elbow and jam. Generic compactor bags should fit it.

HEAT

In the evenings and in cloudy weather during the summer the outdoor temperature drops enough to require some interior heat. If on shorepower or with the generator on-line plug in the small portable electric heaters on board. These are usually kept in the Master suite or under the bar sink in the salon.

For more heat there is a Webasco Diesel furnace. It distributes the heat by heating water and circulating it throughout the boat. There are temperature controls with integrated fans in each area of the boat. Be certain that one or more of the temperature controls are calling for heat. If all are closed the furnace will shut down.

To start the furnace, turn on the toggle switch in front of the wine cabinet. It will take about a half-hour for the water to heat and to feel the heat in the salon. After starting the furnace check the furnace exhaust on the exterior port side of the boat – aft cockpit area. You will know the furnace is working if the exhaust is warm. Later it will become hot so be sure there is nothing near the exhaust and there is no fender near the exhaust.

ELECTRONIC EQUIPMENT

In the pilothouse, in the cabinet over the table there are manuals on board for each electronic item. Refer to these and practice with the instruments on sunny days and in home waters to develop the familiarity you will need when you have to depend on them.

VHF RADIOS

There are two mounted VHF radios. One at each steering station. Make sure the breaker is on at the DC Panel. Always monitor Channel 16 while underway. Use channel 16 only for the initial contact or for emergencies. Switch to another channel for conversation. Remember everyone listening can hear what you say.

The radios have channel tuner knobs, squelch and volume controls on the face of the units. They also have buttons for weather (WX) and quick return to channel 16. The hand held microphone has a “push to talk” button. Push to talk, release to listen

DEPTH SOUNDERS

There are individual depth sounders located on the upper and lower helm. The switch for both is located on the upper helm. These sounders are typically reliable in waters less than 200 feet deep and at slower speeds. If your sounder is blinking, it might be a false reading due to excessive depths or strong currents. Watch you depth carefully in cruising unknown waters that might have rocks or obstacles.

Remember that sounders do NOT look in front of the boat, only UNDER the boat. They do not tell you if you about to run aground, only if you haven’t already. Use them in close conjunction with your charts.

NAVIGATION, GPS, RADAR

Star Dancer has two independent navigation and GPS systems.

Nobeltec operates with a standard computer. The computer is located behind the removable panel on the starboard side of the pilothouse. There is a “scratch” on the top

of the computer box showing that the computer's "reboot" switch is just below. Normally you will not need to use the "reboot" switch. To turn on the system check to be certain the two breakers on the AC and DC sides of the panel are turned on. (They should never be turned off.) Turn on the display by depressing a button on the right side of the display. The screen should begin to "paint". Use the mouse to make selections and finally enter the password "20stardancer07"

The Nobeltec system has the AIS system to identify commercial watercraft. It identifies the location of the vessel; it's course/speed and its name.

The Raymarine system screen is just fore of the wheel in the pilothouse. Its independent GPS system is a nice backup for Nobeltec. The screen is smaller so there is less detail. Play with the system so that it's use becomes easier.

Raymarine is also the radar for Star Dancer. You are at the center of the screen. The top of the screen is dead ahead. The higher the range, the more gain you want. Use filters sparingly as they may filter out targets you are looking for. The EBL (estimated bearing line) and the VRM (variable range marker) are extremely useful.

Note: DO NOT GO ON THE BRIDGE WHILE THE RADAR IS TRANSMITTING. It is not healthy to be scanned. Put the radar on standby if anyone goes topside. There are no navigation systems or radar screens on the flybridge.

ANCHORING

The primary working anchor is a Delta anchor with over 300 feet of chain. The chain is passed through the deck from the anchor locker. The locker can be accessed through the master stateroom (behind the mirror). The chain is attached to a 25' length of nylon line which is attached to Star Dancer. The purpose of the line is to enable Star Dancer to be released from its anchor if it is snagged and cannot be released from the bottom. The nylon rope would be cut and the anchor and chain would be sacrificed.

The anchor chain is marked with white, blue and red paint stripes so you can tell how much chain you have let out.

Stripes	Feet
1 white	25
2 white	50
3 white	75
1 white, 1 blue	100
1 blue	125
2 blue	150
3 blue	175
1 blue, 1 red	200
1 red	225

2 red	250
3 red	275
Solid red	300

Always have the engines running when raising or lowering the anchor. The Windlass (Winch) power breaker is located on the Master Battery Control Panel in the cabinet just to the port of the salon door. The Windlass is operated by using the foot switch in the foredeck.

On the starboard side of the winch is a three-pronged handle. This is a clutch that can be loosened (if the windlass stopped working electrically you could loosen the clutch to lower the anchor by gravity and control its descent) or tighten the clutch if the windlass is slipping. The handle that fits these prongs is stowed in the pilothouse cabinet under the electrical pane. It looks like a stainless steel pipe with a black rubber grip on one end. On the front of the winch are 2 pauls that have to be moved out of the way to lower the anchor (the same handle fits the upper of these two pauls in case you have to raise the anchor manually)

To Anchor:

1. Turn on the "Windlass Power" switch in the salon.
2. Pull the pauls back away from the gear teeth at the front of the drum (Winch is powerful so watch fingers and toes.
3. Uncap the button on deck that points forward (one on the left). Tap it with your toe to get 1 or 2 feet of slack.
4. Push the anchor out by hand until there is a little weight on the chain, then step on the "down" button.
5. Put out the proper amount of scope
6. Return the pauls back in place on the gear teeth. Forgetting this may burn up the clutch.
7. Set the anchor with either or both engines in reverse, gently at first
8. Turn off the "Windlass Power" in the salon.

To Weigh Anchor:

1. Turn on the "Windlass Power" switch in the salon.
2. Uncap the button on the deck that points aft (the one on the right) and tap the button with your toe to take up slack chain on the rode. Have your first mate at the upper helm so you can communicate with each other. As you take up the chain move the boat SLOWLY forward with the engines being careful not to run over the chain.
3. The rode chain and anchor will likely come up muddy or dirty. With the hose in the foredeck hatch, having turned on the wash-down pump, spray the chain and anchor to clean it as it comes in. PLEASE DON'T PUT THE CHAIN AWAY MUDDY AS IT WILL LEAD TO A SMELLY, MUSTY BOAT.

4. When the anchor is clear of the water and close up to the bow roller, bring it in slowly so it doesn't slam into the hull or the roller. Usually it is best just to handle those last few feet by hand.
5. Turn off the "windlass Power" switch.

Note: There is a Chapman's on board with discussions on anchoring.

A spare anchor, chain, and line are located in the Starboard lazarett. This "lunch anchor" is for emergencies and is not typically adequate to hold the vessel by itself.

Remember your requirement to have your anchor light on during hours of darkness.

MOORING BUOYS

There are many marine park mooring buoys in Puget Sound, San Juan Islands and Canada. They eliminate your need for anchoring and are recommended in crowded bays, etc. They are maintained and thus eliminate concerns of dragging, scope and swing. It can be a bit of a task to hook the metal rings on these buoys in order to tie up. The key is having good communication with the skipper as to where the buoy is as you approach and a strong person with the boat hook. You may also launch the dinghy and have someone feed a line through the mooring ring and back to the boat from there. The best way to tie to a buoy is to secure a line to one of the bow cleats, run the line through the metal ring on top of the buoy and back to the bow cleat on the opposite side. Using separate lines from each cleat will add safety and reduce wear on the lines with less rubbing on the ring. There is typically a nominal fee to support the parks and buoys.

STERN TIE

There is a 200 foot stern line located in the starboard lazarette.

ENTERTAINMENT SYSTEMS

AM/FM/CD STEREO

There are stereos on the flybridge and in the master suite. Check that appropriate breakers in the pilothouse are on.

There is a TV and a CD/DVD player in the salon with 4-speaker surround sound. The master suite has a 13" TV with an integrated DVD player.

To use the salon systems the DC circuit breakers for "salon receptacles" and Stereo/TV must be on.

There is no Satellite TV and receiving local TV is unlikely. The TV's are best for viewing DVDs.

INTERNET ACCESS

Star Dancer subscribes to the Clear Network. It provides 4-G internet connections. The password is "20stardancer08".

BARBECUE

The barbecue is mounted on the starboard flybridge.

Attach the propane bottle and regulator. The regulator should lock in-place, as you rotate down, be careful not to drop this overboard.

The barbecue can be lit manually if you have trouble lighting with the igniter. If needed there are butane lighters located in the bar cabinet near the barbecue. This barbecue cooks fairly hot and fast so keep an eye on your food.

Please clean and wipe down with a rag or paper towel when finished. For safety reasons, do not store an opened propane bottle in the salon or engine compartment. Ensure that there are no flammables near barbecue.

DINGHY AND DAVIT

Star Dancer is equipped with a 10-foot Zodiac with a 35 HP outboard. The Zodiac is named "Starlet". Please do not use it to go ashore unless there is a dock. Most shorelines have rocks offshore that are nearly impossible to spot. The outboard is a 4-stroke and uses regular gas. The gas tank is under the mid-seat and a spare gas container with 2 gals of gas is kept on Star Dancer. The dinghy is very fast and it can be easy to get thrown out at high speed. Use the "man overboard" tether and wear or take along one life jacket per person.

DAVIT

Remove any extra weight from the dinghy before trying to hoist or lower. Do not allow anyone to ride in it while it is being lowered or raised. You need at least one other person and their COMPLETE ATTENTION. The control cable for the davit is kept in the cabinet under the bar sink on the flybridge. It plugs in near the base of the davit. The davit arm must be raised to the upper position if it is not there already. Do this by removing the large pin and reinserting after raising the arm. It is easier to do this if you swing the arm out over the water to give yourself more room.

To lower the dinghy

Put in the stern plug. It is found in the "glove compartment" of the dinghy

Attach the 3-point harness to Starlet and attach the lifting cable to the harness

Release the ties holding Starlet to her mounting brackets.

Release the line that is tied to the front mounting bracket.

Put on a stern line on the starboard side of Starlet to help guide the dinghy as it's lowered.

Station a crewmember in the cockpit to guide the dinghy as it is lowered and to keep it from swinging and damaging Starlet or Star Dancer.

Using the davit control cable lift Starlet about a foot above her mounts, push the davit arm so that it swings to port carrying Starlet. Using the bowline and the starboard line to control the attitude of the dinghy lower it slowly to the water.

When Starlet is in the water and tied to Star Dancer remove the 3-point harness and raise the lifting cable and attach it to its ring on the flybridge.

To raise or return the dinghy

Remove any extra weight and water from the dinghy.

Attach the 3-point harness and attach the lifting cable to the harness.

Orient Starlet, bow forward, on the port side of Star Dancer.
Using the bowline and the starboard line to guide the dinghy, raise Starlet to a position about 1 foot higher that her mounting brackets. Pull Starlet and the davit arm inboard so that Starlet rests just above her mounting brackets. Slowly lower her to her bracket resting points.

Secure the dinghy to the deck with the bowline and the two stern straps.

Unscrew the drain plug from the dinghy and place it in the dinghy glove box. Allow the water to drain from the dinghy.

Detach the lifting cable from the 3-point harness and attach the lifting cable to its ring on Star Dancer. Remove the davit control cable and replace it in the cabinet on the flybridge.

Note: If the davit motor stops while lifting the dinghy, check the Davit Breaker on the Master Battery Panel by the salon door. Pausing a couple of times while lifting will let the motor cool and prevent this from happening. If it is tripped, reset and continue

OPERATING THE DINGHY

Be certain to have the ignition key to the dinghy with you. Board the dinghy

Check to be sure you have gas.

Tilt the outboard down if has been raised. The tilt switch is on the starboard side of the outboard engine.

Check to be sure the red insert is in place on the "man overboard" tether. There are two, one on the outboard engine and one close to the throttle.

Squeeze the black bulb, on the outboard engine, many times until it feels firm and full of fuel.

Lift the lever to the left of the throttle control. This is the choke. It will bring additional fuel into the engine to start.

To start the engine: Pump the throttle a couple of times and with the choke elevated turn on the key. You may have to try several times. When the engine starts lower the choke lever but not all the way. Allow time for the engine to warm, about 5 minutes. Lower the choke lever all the way. After releasing the lines from Star Dancer advance the throttle slowly to get underway.

NOTE: There is a handheld VHF radio with a charger in the cabinet under the main circuit board in the pilothouse. Take this radio with you to communicate with Star Dancer. The radio is waterproof and it floats. Do not use channel 16.

OTHER STAR DANCER SYSTEMS

TRIM TABS

The trim tabs have a DC circuit breaker. The controls are to the right of each wheel. The trim tabs are for use at fast speeds only to help trim the bow down over its wave to a planing angle. It can also help level the boat to either side at lower speeds. Remember you can trim the bow too far down.

CAUTION: Do not press one tab down at the same time you press the other one up. This will blow a fuse. PLEASE, whenever you slow down off a plane, turn the tabs all the way up. (To determine when they are up or down, you can press the controls either up or down and hold them while you count off 10 or 20 seconds)

SEARCHLIGHT

The searchlight has a DC circuit breaker labeled “searchlight”. Be careful, the light gets hot. The light works from either upper or lower helm depending on how you’ve switched the controls.

WASH-DOWN PUMP

There are two. One is near the anchor on the bow and the other is in the port locker in the cockpit. Both have coiled hoses with a nozzle for convenience.

There is one more wash-down unit located next to the aft cockpit door to the swimstep. This is a freshwater wash-down for washing off swimmers.

BILGE PUMPS

Although you see only three circuit breakers on the DC switch panel for bilge pumps there are actually six bilge pumps. Three are wired directly to float switches that are directly wired to the Accessory Battery. These are designed as standby pumps, always guarding against the event that the boat might start taking on water when no one is aboard to notice and help out. The other pumps are energized by turning on the switches labeled “Aft”, “Mid” and “Fwd” on the DC panel, then using the switches at either helm.

It is advised that you run the bilge pumps at the end of each day if you have seen any water in the bilge. The forward and midship pumps will generally not pump anything unless you’ve been showering without the sump switch on and the passageway carpet is soaked. The aft one will usually pump a while because it is in the engine room and the stuffing boxes (where the shafts go through the hull to the props) usually leak. Star Dancers stuffing boxes leak very little. Watch out the port side while these pumps are running so that when the bilge runs dry you can turn them off. Letting them run dry may burn them out. Monitor how much comes out and check that it is not polluted. (If either becomes a concern, notify AYC)

MISCELLANEOUS

Safety should be paramount to your daily cruising. A “person overboard drill” should be discussed and practiced using the throw ring in the cockpit.

Always have a sharp lookout posted for logs, deadheads, or other possible hazards. A log hitting your prop can ruin your vacation. . Debris does seem to gather along current lines. It is sometimes best to go around these areas and miss the minefields.

Star Dancer is equipped with numerous automatic bilge pumps that can be manually activated from either helm. If you continually hear the bilge pump running, check your bilge. You may have a serious problem or you may have just accidentally hit the manual bilge pump to ON. Lights indicate operation.

Spare parts are located in a box in the starboard lazarette. They include extra oil filters, impellers, belts, etc. Extra oil, transmission fluid and coolant are located in the compartment under the stairs to the engine room. There are also spare parts for the vacuflush toilets in the box.

Crabbing is fun but requires the correct license and season. Please be sure not to crab off the stern as the crab line can easily get tangled in the prop as you swing with wind or current. You don't want to be the person who has to dive over and cut the line out of the propeller. It is best to use the dinghy to set your crab pot away from the boat (take care not to foul the dinghy prop also). Please clean up any seaweed or crab shells afterwards to keep the boat neat and tidy.

The tool kit is located under the mid-ship cushion in the pilothouse.

Some cabinet doors are held open with springs. Please remember to poke the springs to close their doors. If you forget, the springs will be stubborn, and you may rip out their screws at either end.

The foredeck cushion is stored in the aft shower. Please bring it in if the weather is inclement or your cruise is finished. Please also help protect the flybridge seat cushions by covering them in inclement weather and at night. If the cushions get wet tilt them up until they dry then cover with their canvas.

DO NOT WALK ON THE BLACK PLASTIC HATCHES on the foredeck. They are slippery and weak. Instruct your crew.

CLEAN UP

Rinse salt off the boat ASAP. It eats into the fiberglass, metal and glass in a very short period of time.

Leave yourself plenty of time every trip to wash the boat. Don't hurry and try to return in time to do it in the daylight. A hose is under the starboard lazarett in the cockpit, buckets are in there too along with cleaning supplies. You can arrange for a cleaning service before you leave for your cruise and they will do the cleaning for you.

Use the navigation log checklist to be sure you clean everything. Try to get into the corners of things. If everyone tries to clean one extra area after each trip the positive momentum will be a marvel and we all will benefit.

To wash the boat its best to start on the bridge and get its canopy and outside plus the dinghy at the same time, then all the foredeck, each side deck and the aft deck with the transom---a total of 5 sections. While one person scrubs another can rinse and please rinse the salt off the sides of the hull. A soft brush works best for smooth fiberglass and a hard bristle brush for non-skid surface. Do not use abrasive on fiberglass.

Pay special attention to:

Removal of diesel soot from transom and from around the diesel furnace exhaust.

Removal of black streaks from hull.

Scuff marks removed from hull (usually made from brushing docks or from dragging hoses or cables on the top deck)

Windows cleaned with squeegee

LEAVING THE BOAT CHECKLIST

Dinghy motor lowered, dinghy washed and scum removed, seats cleaned, fuel filled, tie down straps secured, cover boat, secured davit cable and weight. Place key in pilothouse starboard drawer and the davit control in the cabinet under the electrical panel.

All portholes and windows closed and latched.

Bow cushions cleaned, removed and stowed in the aft head shower. Flybridge cushions cleaned, dried and covered with canvas

All canvas installed, miniblinds closed to keep sunlight off the carpet and upholstery

AC cord attached and secured against chafing, dock box switches on and 110 volts AC reading on the voltmeter. All selector switches set to shore power. On the AC panel line #1, leave on the “Battery Charger” and the “Salon” and “Galley” receptacles for the space heaters. On line #2 leave on the “Master Stateroom” and the “Aft Stateroom” for space heaters. On line #3 in the winter leave on the receptacles.

All DC switches on the pilothouse electrical panel off. DC and Engine Ignition master switches off.

Lines and fenders secured: Dockside fenders mounted low to protect from dock chafing and fenders on the side next to adjoining slip mounted high to protect from boats touching. Two crossing spring lines tied securely. Stern line tied loosely. Two bowlines tied loosely

Do a last walk through the boat to check for forgotten personal gear, left open portholes, a head not cleaned, etc.

Lock pilothouse sliding door and salon door and place key in port cockpit cabinet. As you walk away, check the tie-up, fenders, and shore power connection again. Remember that no one may be using the boat for a long time.

Hopefully tuck away another great cruise, a wonderful experience and a colorful memory.

SPECIFICATIONS AND IMPORTANT NUMBERS

Vessel Make/Model	Meridian 490 Pilothouse
Year	2003
LOA	54 feet
Beam	15 feet 1 inch
Draft	3 feet 4 inches
Bridge Clearance	18 feet 2 inches
Fuel Capacity	444 gal.
Fresh Water Capacity	200 gal.
Water Heater Capacity	18 gal.
Holding Tank Capacity	48 gal.
Weight	29,990 lbs
Engines	Twin 330 hp Cummins Diesels
Generator	9 KW Onan
Inverter	

Vessel Documentation Number (USCG)	1182537 (Registered in USA)
Hailing Port	Anacortes, WA
Customs Decal Number (2010)	0538788
Hull ID Number	MDNF 4029D 303

Owner: Sea Star Yachts, LLC
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